

# OPERATOR'S MANUAL

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**Cooling Unit**

**LMK 1.3D/U**



manufactured by:

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MANTOVA  
ITALY

## **IMPORTANT !!!**

**The manufacturer does not accept responsibility for any action of the user, aimed to repair or simply to use the product covered by this guide, not in conformity to the instructions here enclosed. The manufacturer does not accept responsibility for damages to people or goods.**

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# INTRODUCTION • 1

Congratulations for your choice. To avoid troubles with your new cooling unit simply follow the directions of this manual.

This manual must be intended as a support to a good use of your refrigeration unit but obviously it cannot help for all the cases of problems connected to the temperature controlled transports. Therefore, for your safety and for a longer operating life, we recommend to contact the nearest service point at any time.

## PRECAUTIONS • 2

Access the unit may involve certain risks. Any operation must be made by specialists.

### **SUGGESTIONS:**

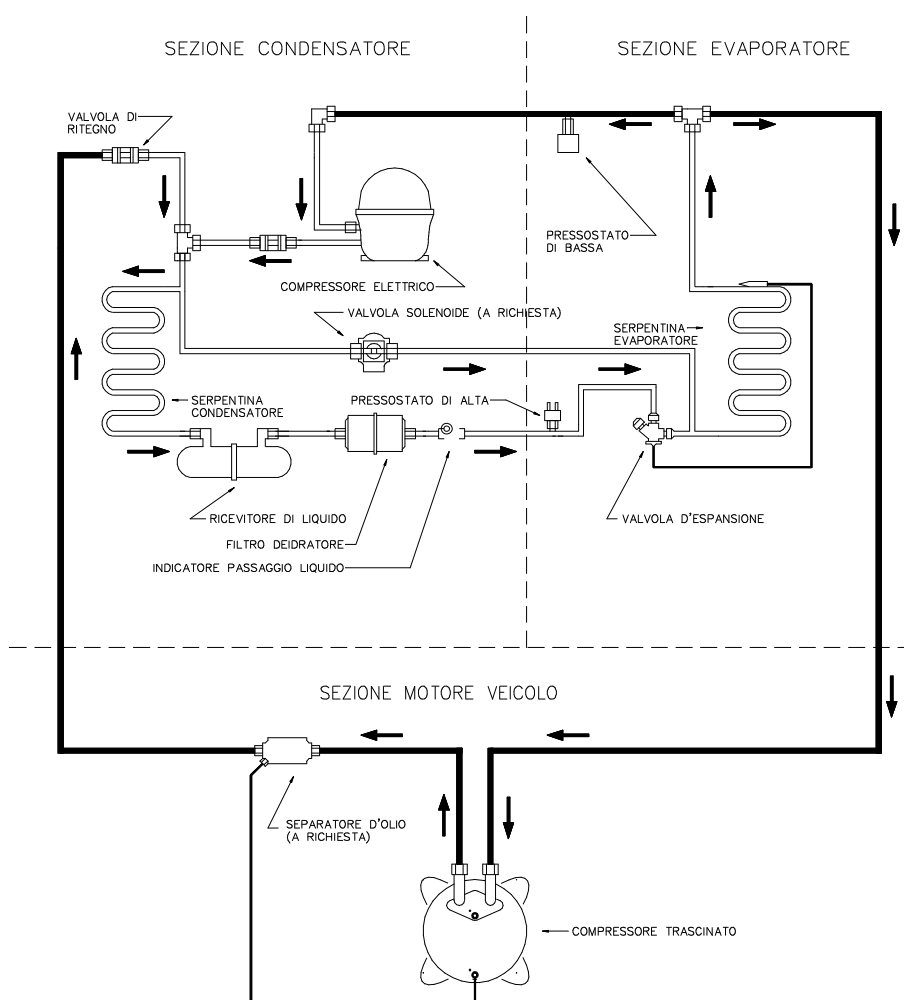
- Take every safety measures before accessing the unit.
- When performing maintenance procedures on the refrigeration unit, make sure the unit is disconnected from the power source, the cab control is in OFF position and no automatic start-up are possible.
- Pay attention to the risks due to the presence of copper pipes with dangerous temperature gas circulation (positive or negative).
- Pay attention to the risks due to the presence of dangerous line voltage.
- Pay attention to the risks due to the presence of dangerous fans. Evaporator and condenser fans are protected by safety grills.
- Pay attention to the risks due to the danger involved by the sharp fins of the evaporator and condenser heat-exchangers.

# UNIT DESCRIPTION • 3

FRIGO LAMAR LMK 1.3E has been studied to equip small/medium delivery vehicles. The unit is manufactured as split-system to fit any kind of vehicle. This cooling unit is recommended when the customer has problems with the height of the vehicle as the condensing unit is fitted under the floor of the vehicle, in a safe position, and not on the roof. The unit can be driven by the vehicle engine during the daily use or by switching to standby during the parking time.

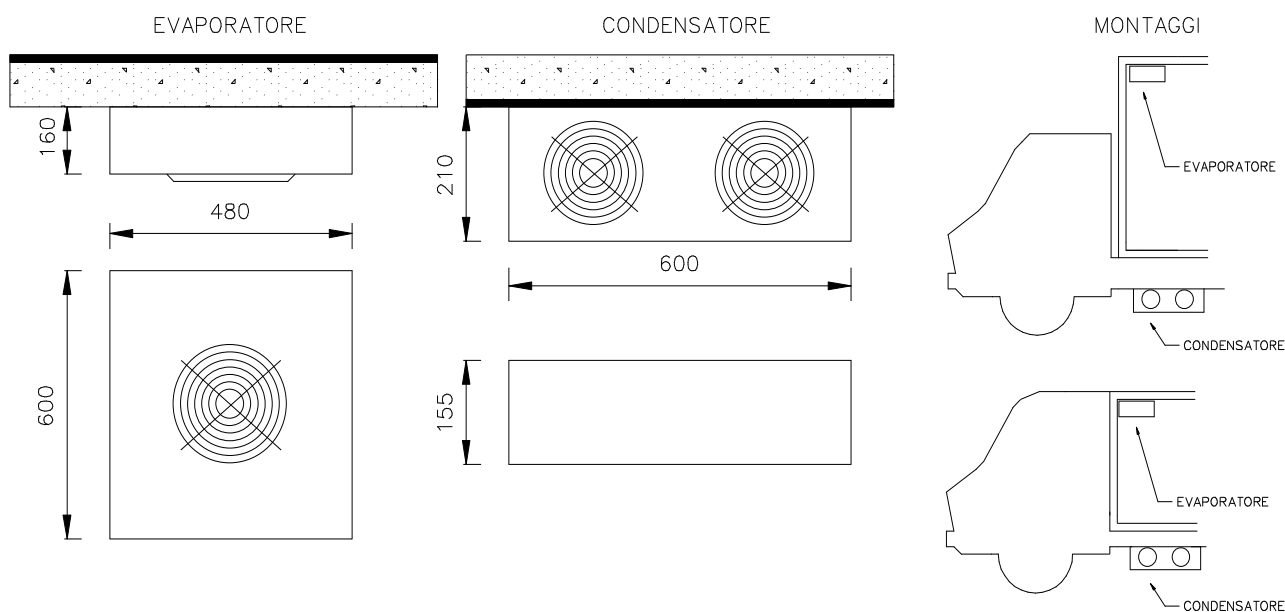
- **LMK 1.3E D/U:** unit working only driven by engine.
- **LMK 1.3E DN/US:** unit working driven by the vehicle engine and by switching to standby.

## 1. CIRCUIT DIAGRAM:



# UNIT DESCRIPTION • 3

## 2. DRAWING:



### Protection devices:

Protection devices under described protect the parts of the unit LMK 1.3E. It's imprudent any action not executed by specialist personnel.

**FUSES:** two 15A fuses protect the fans, they are located into the electrical equipment box; a 4A fuse protects the transformer, this fuse is located into the electrical equipment box; a 8A fuse protects the cab-control, this fuse is located into the cab-control box; general protection is guaranteed by a 30A fuse, this fuse is located near the battery of the vehicle.

**HIGH PRESSURE SWITCH:** stops the working of the unit in case of elevation beyond the concurred limits of the cooling gas pressure (due to a malfunctioning of the fan of the condenser, as an example). It is located on the right side of the heating exchanger.

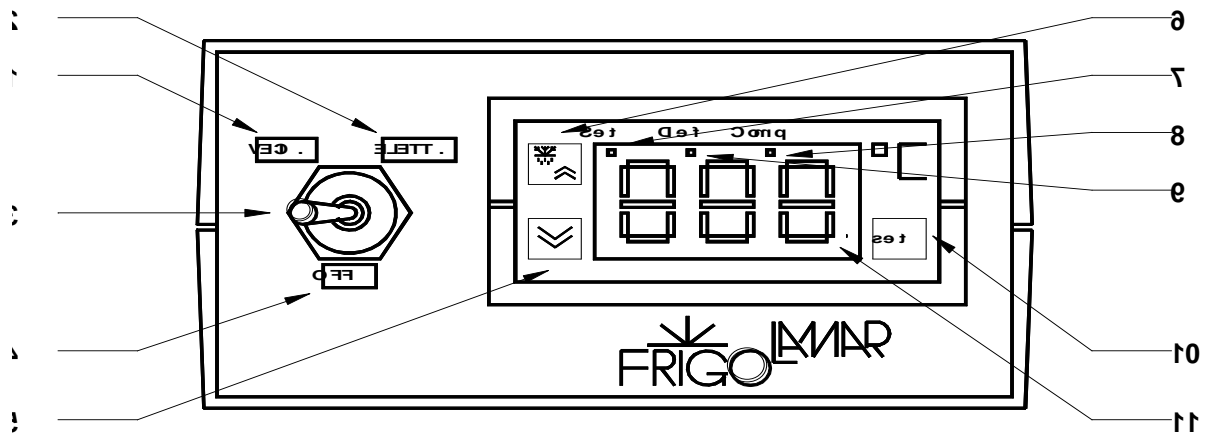
**LOW PRESSURE SWITCH:** stops the working of the unit in case of lowering beyond the concurred limits of the cooling gas pressure (due to a leak in the gas circuit or to the gas filter, as an example). It is located close to the left electrical compressor.

# UNIT OPERATION • 4

Before starting the unit:

- Check the good condition and the belt tension of the engine driven compressor.
- Frequently get a look to the unit looking for leaks, loss of oil or gas, not working parts and whatever.
- Frequently make sure, at the end of the working day, to see water under the vehicle close to the drain hose. If you don't see water apply to your dealer to check for obstructions of the hose.

The unit is controlled by the **cab-control** (fig. 2). The unit works by standby during the parking time or by the engine of the vehicle on road. The cab-control compounds a digital thermometer indicating the temperature inside the van, a thermostat to set the required value of temperature, a switch (3) to set the operating system: off (4), on road (1), standby (2):



(fig. 2)

## **Use of the unit by the Cab-control:**

- Start the vehicle engine;
- Set the switch (3) in VEIC position (1). The digital display (11) will blink for a few seconds, the necessary time for a quick diagnosis, then will show the temperature inside the van;
- Press the SET key (10) to check the temperature value previously set.
- To modify the temperature press the keys (5-6) located on the left of the box: the key on top (6) to increase the temperature, the key on bottom (5) to decrease the temperature. At the end of this procedure, after a few seconds, the display will show again the temperature inside the van. When the compressor is working the warning light (8) is on. When reached the required temperature the unit will stop. After an increasing of two degrees the unit will start again automatically;
- To shut-down the unit set the switch in OFF (4) position;
- The unit must be shut-down before connecting or disconnecting the standby supply cable;
- Check that the type of current corresponds to the one your unit requires;
- Connect the unit to the power network;
- Set the switch in ELETT (2) position.
- The defrosting system will start automatically (usually every 2/3 hours). During the defrosting time the digital display indicates DEF and the warning light (9) is on. You can start manually the defrosting by pressing for a few seconds the key (6).



### **A few suggestions:**

- Check for abnormal noises when the unit is working.
- Pre-cool the van for 20/30 minutes before loading the goods.
- Evacuate the existing humidity by operating a manual defrost (this is possible only at proper temperatures).
- When loading check the temperature of the products to ensure they are at a proper temperature to be transported.
- **The cooling unit has been engineered to maintain the temperature of pre-cooled products not to refrigerate warm goods.**
- In order to enable a good air-flow circulation, around and through the load, pay attention to leave free space enough between the load and the box walls.
  
- If the cab-control does not switch on check the efficiency of the 8A fuse located on the back of the cab control box;
- If the unit does not work on road, check the efficiency of the 30A fuse located close to the battery of the vehicle;
- If the unit does not cool enough check the level of the refrigerant gas (2 kg of R134a), looking at the window located on the gas filter.
- If the compressor does not work on road check the efficiency of the 8A fuse located into the electrical equipment box (also check the standby supply cable is disconnected).
- If the condenser fan or the evaporator fan do not work check the efficiency of the 16A fuse located into the electrical equipment box (also check the standby supply cable is disconnected).

**THE UNIT STARTS UP AUTOMATICALLY.**  
**KEEP WELL AWAY FROM MOVING PARTS**  
**(BELTS, PULLEYS, FANS)**

**FOR ANY PROBLEM DO NOT HESITATE TO CONTACT**  
**YOUR SERVICE CENTER**

## TECHNICAL FEATURES • 5

Power supply:	220/240 V
Max electrical current absorption:	20 A
Refrigeration power at 0°C (ext. temp. = 30°C):	2029 W
Refrigeration power at -10°C (ext. temp. = 30°C):	1307 W
Refrigeration power at -20°C (ext. temp. = 30°C):	772 W
Belt driver compressor:	SANDEN SD 505
Electric compressor (2):	ASPERA J6220ZX
Condenser fan:	1 SPAL Ø 190 mm (VA14-AP11/C34A)
Evaporator fans:	1 GATE Ø 250 mm (12V)
Thermostatic valve:	DANFOSS TEN 2
Refrigerant gas:	R134a